



ArcLamp® System Installation Manual

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Table of Contents

	Introduction	1
	Document Conventions	1
	Help from ETC Technical Services	2
Chapter 1	System Overview	4
	Maximum System Limits	4
	ArcLamps	5
	Overview	5
	Ordering Information	6
	ArcLamp Driver	6
	ArcLamp Driver Weight and Dimensions	7
	Wiring Specifications	7
	Control Specifications	9
Chapter 2	System Installation	10
	Installation Location	10
	ArcLamp Installation	11
	ArcLamp Driver Installation	12
	ArcLamp Voltage Drop	12
	Prepare for Installation	12
	Mount the Driver	13
	Terminate Wiring	14
Chapter 3	System Power Up	21
	Power Up Procedure	21
	Troubleshooting	22
	LED Indicators (350W and 700W standard and emergency models only)	22
	Overload Protection	23
	Fade to Warm Behavior	23
	Configuration and Commissioning	24
	Maintenance	25
	ArcLamps	25
	ArcLamp Driver	25

Appendix A	Bridging Output Channels	28
	Voltage Drop	28
	Bridging Kits	29
	Bridging Procedure.	29
	150W Drivers.	30
	350W and 700W Drivers.	31
 Appendix B	 ArcLamp Emergency Driver Power Input Wiring.	 32
	The complete installation procedure	34
	Terminate Normal Sense Input	35
	Terminate Maintained (Emergency) Input	36
 Appendix C	 TX1 Installation	 37
	Preparing for Installation.	38
	Supplies	38
	Electrical and Wiring Specification	38
	Surface Mounting.	38
	Terminate Wiring	39
	Power Input	40
	DMX In and DMX Out	41
	Auxiliary Input	42
	Final Installation and Power Up	42
	Front Panel LEDs.	42
	Attach Antenna	43
	Dual Redundancy Operation	43
	Maintenance	43
	Fuses	43

Introduction

Congratulations on your purchase of ArcLamp System products. ArcLamp is a range of retrofit screw-in LED lamps for use in any third party lighting fixture with a compatible base.

ArcLamp is powered using a dedicated driver that seamlessly integrates into existing building wiring infrastructure and provides advanced level control and dimming features.

This guide provides step by step instruction on the installation of your ArcLamp system.

ArcLamp products are intended for professional use only. **Read the entire manual before using this equipment.**

Document Conventions

This document uses the following conventions to draw your attention to important information.



Note: *Notes are helpful hints and information that is supplemental to the main text.*



CAUTION: *A Caution statement indicates situations where there may be undefined or unwanted consequences of an action, potential for data loss or an equipment problem.*



WARNING: A Warning statement indicates situations where damage may occur, people may be harmed, or there are serious or dangerous consequences of an action.



WARNING: **RISK OF ELECTRIC SHOCK!** This warning statement indicates situations where there is a risk of electric shock.

When viewing this document in electronic form (PDF file) with Adobe Acrobat Reader, blue italicized text followed by a page number, such as *[Help from ETC Technical Services](#) on [page 2](#)*, is a link within the document. Clicking on the link will jump to that section or topic within the PDF.

Please email comments about this manual to: TechComm@etcconnect.com.

Help from ETC Technical Services

If you are having difficulties, your most convenient resources are the references given in this document. To search more widely, try the ETC website at etcconnect.com. If none of these resources are sufficient, contact ETC Technical Services directly at one of the offices identified below. Emergency service is available from all ETC offices outside of normal business hours.

When calling for help, please:

- Have a detailed description of the problem
- Be near the equipment for troubleshooting
- Have a notification number if you have called in previously

Americas

Electronic Theatre Controls Inc.
Technical Services Department
3031 Pleasant View Road
Middleton, WI 53562
800-775-4382 (USA, toll-free)
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26-28 Victoria Industrial Estate
Victoria Road,
London W3 6UU England
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Technical Services Department
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Tower 1, Phase 1 Enterprise Square
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Technical Services Department
Ohmstrasse 3
83607 Holzkirchen, Germany
+49 (80 24) 47 00-0
techserv-hoki@etcconnect.com

IMPORTANT SAFEGUARDS

When using electrical equipment, basic safety precautions should always be followed including the following:

- **READ AND FOLLOW ALL SAFETY INSTRUCTIONS.**
- Do not use outdoors.
- Do not mount near gas or electric heaters.
- Equipment should be mounted in locations and at heights where it will not readily be subjected to tampering by unauthorized personnel.
- The use of accessory equipment not recommended by the manufacturer may cause an unsafe condition.
- Do not use this equipment for other than intended use.

SAVE THESE INSTRUCTIONS

Chapter 1

System Overview

The ArcLamp System is comprised of ArcLamps and the ArcLamp Driver. This system of products is designed to provide for easy retrofit of an existing space, or simple straight-forward installation for new construction.

For renovation installations, ArcLamps simply connect to the ArcLamp Driver using the wires from existing incandescent luminaires, eliminating the need for invasive rewiring.

ArcLamp is an LED source that is available in several models including the choice of screw base, color temperature, and clear or frosted glass finish. ArcLamp is designed to be the energy-efficient solution for chandeliers, sconces, wall lights, proscenium lights and more.

The DMX-controlled ArcLamp Driver includes onboard device management with up to four individually addressable output channels per driver, ensuring fast and simple installation. ArcLamp Systems are available in 150W, 350W, and 700W models supporting 25, 60, or 120 individual 4.4W replacement ArcLamps.

Maximum System Limits



Models are available to meet your installation requirements:

ArcLamp System-150

- driver model ARCLMD150CV24
- up to 25 individual 4.4W ArcLamps
- 1.5A per channel maximum current
- 36W per channel maximum power
- maximum of 6 lamps per channel

ArcLamp System-350

- driver model ARCLMD350CV24
- up to 60 individual 4.4W ArcLamps
- 3.5A per channel maximum current
- 80W per channel maximum power
- maximum of 15 lamps per channel

ArcLamp System-700

- driver model ARCLMD700CV24
- up to 120 4.4W ArcLamps
- 7A per channel maximum current
- 160W per channel maximum power
- maximum of 30 lamps per channel

ArcLamp Emergency System-150

- emergency driver model ARCLMDE150CV24
- up to 25 individual 4.4W ArcLamps
- 1.5A per channel maximum current
- 36W per channel maximum power
- maximum of 6 lamps per channel

ArcLamp Emergency System-350

- emergency driver model ARCLMDE350CV24
- up to 60 individual 4.4W ArcLamps
- 3.5A per channel maximum current
- 80W per channel maximum power
- maximum of 15 lamps per channel

ArcLamp Emergency System-700

- emergency driver model ARCLMDE700CV24
- up to 120 4.4W ArcLamps
- 7A per channel maximum current
- 160W per channel maximum power
- maximum of 30 lamps per channel



Note: *It is possible to add a seventh ArcLamp to one channel of an ArcLamp System-150 Driver or ArcLamp Emergency System-150 Driver for a total of 25 ArcLamps.*



Note: *Each ArcLamp Driver provides up to four individually addressable output channels.*

All output channels have onboard overload protection. See [Overload Protection](#) on [page 23](#).

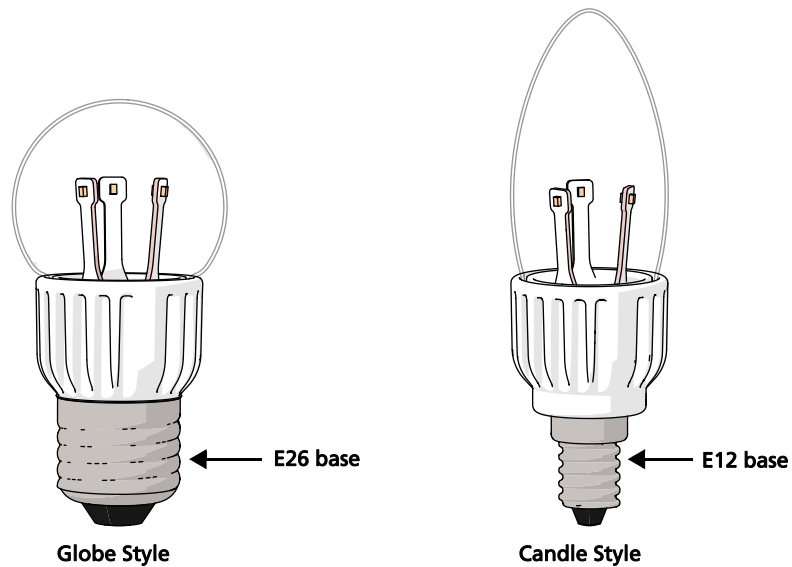
ArcLamps

Overview

Both the candle and globe shape provide a low-voltage LED lighting solution for chandeliers, sconces, wall lights, proscenium lights, and more.

- full load power consumption (4.4W)
- available in Fade to Warm (FTW) version with color temperature red-shift as it dims
- available in CCT 2700K (standard and FTW) or 3000K (standard only) versions
- low voltage (24 VDC) operation, powered and controlled from an ArcLamp Driver
- dimmable from 0 to 100%
- silent operation

ArcLamp LED lamps install directly to standard medium screw (E26) and candelabra (E12) style bases.



Weight and Dimensions

Type	Weight	Length	Maximum Diameter
Globe Style E12	0.16 lb (73 g)	3.6 in (91 mm)	1.78 in (45 mm)
Globe Style E26	0.16 lb (73 g)	3.5 in (89 mm)	1.78 in (45 mm)
Candle Style E12	0.16 lb (73 g)	4.5 in (114 mm)	1.38 in (35 mm)
Candle Style E26	0.16 lb (73 g)	4.375 in (111 mm)	1.38 in (35 mm)

Ordering Information

Contact ETC Customer Service for ordering information.

Type	Description	ETC Part Number	Model Number
Candle style	2700K Clear Candle E12	7490A1741	ARCLE12C24C2700
	2700K Frosted Candle E12	7490A1742	ARCLE12C24F2700
	3000K Clear Candle E12	7490A1743	ARCLE12C24C3000
	3000K Frosted Candle E12	7490A1744	ARCLE12C24F3000
	2700K Clear Candle E26	7490A1745	ARCLE26C24C2700
	2700K Frosted Candle E26	7490A1746	ARCLE26C24F2700
	3000K Clear Candle E26	7490A1747	ARCLE26C24C3000
	3000K Frosted Candle E26	7490A1748	ARCLE26C24F3000
	Fade to Warm 2700K Clear Candle E12	7490A1801	ARCLFE12C24C2700
	Fade to Warm 2700K Frosted Candle E12	7490A1802	ARCLFE12C24F2700
	Fade to Warm 2700K Clear Candle E26	7490A1803	ARCLFE26C24C2700
	Fade to Warm 2700K Frosted Candle E26	7490A1804	ARCLFE26C24F2700
Globe style	2700K Clear Globe E12	7490A1749	ARCLE12G24C2700
	2700K Frosted Globe E12	7490A1750	ARCLE12G24F2700
	3000K Clear Globe E12	7490A1751	ARCLE12G24C3000
	3000K Frosted Globe E12	7490A1752	ARCLE12G24F3000
	2700K Clear Globe E26	7490A1753	ARCLE26G24C2700
	2700K Frosted Globe E26	7490A1754	ARCLE26G24F2700
	3000K Clear Globe E26	7490A1755	ARCLE26G24C3000
	3000K Frosted Globe E26	7490A1756	ARCLE26G24F3000
	Fade to Warm 2700K Clear Globe E12	7490A1805	ARCLFE12G24C2700
	Fade to Warm 2700K Frosted Globe E12	7490A1806	ARCLFE12G24F2700
	Fade to Warm 2700K Clear Globe E26	7490A1807	ARCLFE26G24C2700
	Fade to Warm 2700K Frosted Globe E26	7490A1808	ARCLFE26G24F2700

ArcLamps require a dedicated ArcLamp Driver to operate. For more information, see [ArcLamp Driver](#) below.

ArcLamp Driver

The DMX-controlled ArcLamp Driver includes onboard device management with up to four individually addressable output channels per driver, ensuring fast and simple installation. ArcLamp Drivers are available in 150W, 350W and 700W models, supporting up to 25, 60, or 120 individual 4.4W individual replacement ArcLamps. All ArcLamp Driver models are wall-mounted.

ArcLamp Emergency Drivers with UL924 are available for systems requiring emergency lighting control. Each fixture with ArcLamps installed can be configured to be UL924 listed when wired to an existing emergency response system.



ArcLamp Driver Weight and Dimensions

Driver Description	Weight	Dimensions
150W standard and emergency	4.2 lb (1.9 kg)	10.25x12.11x2.39 in (26x31x6 cm)
350W standard and emergency	9.4 lb (4.3 kg)	13.70x14.38x3.02 in (35x37x8 cm)
700W standard and emergency	11.1 lb (5 kg)	13.70x14.38x3.02 in (35x37x8 cm)

Wiring Specifications

See also [Wire and Terminal Specifications](#) on [page 13](#).

Electrical Specification

Driver Description	Cooling	Input	Output
150W	convection cooled	100-240 VAC, 50/60Hz (normal)	24 VDC, 4 channels
350W	single fan	100-240 VAC, 50/60Hz (normal)	24 VDC, 4 channels
700W	dual fans	100-240 VAC, 50/60Hz (normal)	24 VDC, 4 channels
150W emergency	convection cooled	100-240 VAC, 50/60Hz (maintained (emergency) and normal sense)	24 VDC, 4 channels
350W emergency	single fan	100-240 VAC, 50/60Hz (maintained (emergency) and normal sense)	24 VDC, 4 channels
700W emergency	dual fans	100-240 VAC, 50/60Hz (maintained (emergency) and normal sense)	24 VDC, 4 channels

Channel Electrical Specifications

Driver Description	Maximum Current per Channel	Maximum Power per Channel	Maximum 4.4W ArcLamps per Channel
150W standard and emergency	1.5A	36W	6
350W standard and emergency	3.5A	80W	15
700W standard and emergency	7A	160W	30



Note: It is possible to add a seventh ArcLamp to one channel of an ArcLamp Driver 150W or ArcLamp Emergency Driver 150W for a total of 25 ArcLamps.

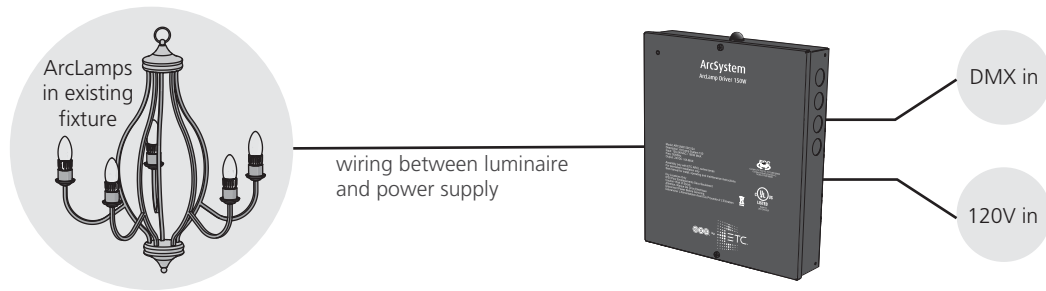
New Construction

All wiring methods must be in accordance with Class 1 control circuits in the NEC. Class 1 circuits are permitted to be installed with other power circuits that are functionally associated:

725.48 (B) (1): “Class 1 circuits and power-supply circuits shall be permitted to occupy the same cable, enclosure, or raceway only where the equipment powered is functionally associated.”

Renovation

For renovation installations, the output of the ArcLamp Driver is reclassified as a Class 1 circuit. The image below shows an example of a typical retrofit system installation.



National Electric Code (NEC) specifies the following for Class 1 installations:

- **725.130 (A) Wiring Methods and Materials on Load Side of the Class 2 or Class 3 Power Source:** Class 2 and Class 3 circuits shall be permitted to be reclassified and installed as Class 1 circuits if the Class 2 and Class 3 markings required in 725.124 are eliminated and the entire circuit is installed using the wiring methods and materials in accordance with Part II, Class 1 circuits.

All wiring methods must be in accordance with Class 1 control circuits in the NEC. Class 1 circuits are permitted to be installed with other power circuits that are functionally associated:

- **725.48 (B) (1): “Class 1 circuits and power-supply circuits shall be permitted to occupy the same cable, enclosure, or raceway only where the equipment powered is functionally associated.”**

Following these NEC specifications for renovation installations, ArcLamp circuits are permitted to share the same containment as other house lighting circuits since they are functionally associated.



Note: *ArcLamp System circuits may only share the same containment as other house lighting circuits.*

If the ArcLamp circuit must share the same containment as non-functionally associated circuits, separate multiconductor Type AC, Type MC, Type MI, or Type TC cables must be used, and all conductors in the cables must be insulated at 600V or greater according to NEC 725.48 (B)(4)(2).



Note: *These retrofit kits can include certified emergency lighting equipment (such as an emergency LED driver) that has been investigated and found to comply with the requirements of ANSI/UL 924, Emergency Lighting and Power Equipment. When installed per the kit instructions, the converted luminaire is eligible to serve as part of a facility's emergency lighting system in accordance with ANSI/NFPA 101, Life Safety Code, Article 700 of ANSI/NFPA 70, National Electrical Code, and the International Building Code.*

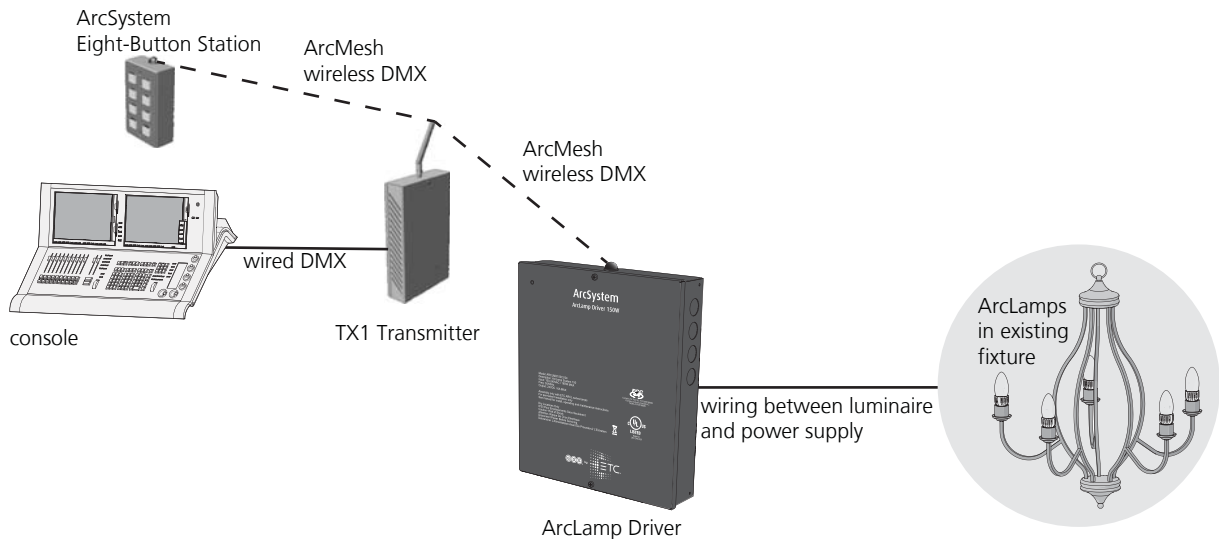
Control Specifications



Note: Each ArcLamp Driver provides up to four individually addressable output channels.

All output channels have onboard overload protection. See [Overload Protection](#) on [page 23](#).

ArcLamp System products can be controlled using wired DMX connections to the ArcLamp Driver or controlled using wireless ArcMesh protocol. The following graphic shows a basic hybrid ArcLamp system installation with wireless ArcLamp Driver, ArcLamps, transmitter, button station, and a wired DMX console for the main control source.



Chapter 2

System Installation

This chapter details the installation and wire termination for each ArcLamp System product.



WARNING: Risk of fire or electric shock. LED Retrofit Kit installation requires knowledge of luminaires electrical systems. If not qualified, do not attempt installation. Contact a qualified electrician.



WARNING: Risk of fire or electric shock. Install this kit only in the luminaires that have the construction features and dimensions shown in the photographs and/or drawings.

Do not make or alter any open holes in an enclosure of wiring or electrical components during kit installation.



WARNING: To prevent wiring damage or abrasion, do not expose wiring to edges of sheet metal or other sharp objects.



Note: *Only those open holes indicated in the photographs and/or drawings may be made or altered as a result of kit installation. Do not leave any other open holes in an enclosure of wiring or electrical components.*

Do not make or alter any open holes in an enclosure of wiring or electrical components during kit installation.

Installation Location

ArcLamp System is designed for use in 0-40C ambient temperature.

ArcLamp Installation

ArcLamps install directly to a standard E26 or E12 style base. Fixtures with ArcLamps installed must only be powered by the ArcLamp Driver.



CAUTION: *ArcLamp is not suitable for use in enclosed luminaires or in spaces with restricted air flow. Should maximum temperature be exceeded, ArcLamp will thermally throttle output to reduce temperature.*



CAUTION: *ArcLamp must not be connected to line voltage!*

Only install ArcLamp in fixtures powered by an ArcLamp Driver. Connecting ArcLamp to drivers or voltages greater than 24V will cause permanent damage to ArcLamp.

ArcLamp must only be used in fixtures with compatible bases.



Note: *The fixture and its installation location must support the ArcLamp. See [Weight and Dimensions](#) on [page 5](#).*



Note: *The number of designated emergency lamps and their height is the responsibility of the specifier and installer in order to achieve the minimum FC levels of NFPA 101. Other installation scenarios should be evaluated by the AHJ to confirm illuminance and performance requirements of ANSI/NFPA and the IBC.*

The LED driver has been evaluated for use with the Recognized OOLV2/8 lamps, models ARCL-E26, ARCL-E12, ARCLFE12, and ARCLFE26 under the following conditions:

- *in open luminaires (no lens or diffuser)*
 - *with the lamps at a maximum height of 17 ft (5.2 m)*
-



Note: *ArcLamp is supplied with a caution label that must be applied to the fixture with the ArcLamp installed. The label states "This luminaire has been modified to operate LED lamps. Do not attempt to install or operate incandescent lamps in this luminaire."*

ArcLamp Driver Installation

ArcLamp Voltage Drop



Note: *The installation site must consider power requirements at the fixture and allow for voltage drop with distance.*

ArcLamp is a 180mA, 24 VDC lamp that contains onboard voltage drop compensation technology. However, correct operation requires a minimum of 21 VDC provided by the ArcLamp Driver at the ArcLamp. Voltage drop calculations vary by project and are based on the type, length, and gauge of wire used between the ArcLamp Driver and ArcLamp. Contact a qualified electrician or ETC technical services for further information.

The ArcLamp Driver must be installed within a maximum distance of the fixture with ArcLamps installed. The table below lists the maximum distance between the ArcLamp Driver and ArcLamp based on using each driver at its maximum rated capacity. These distances will be reduced when bridging driver output channels together (see [Bridging Output Channels](#) on [page 28](#)). Maximum distances depend on wire gauge. See [Wire and Terminal Specifications](#) on [page 13](#) for recommended wire gauges. For your convenience, an interactive voltage drop calculator is available at etconnect.com/ArcLamp.

Maximum Distance Between ArcLamp Driver and Fixture with ArcLamps Installed

Driver Description	Wire Gauge	Maximum Distance
150W or 150W emergency	14 AWG	442 ft (135 m)
350W or 350W emergency	12 AWG	328 ft (100 m)
	14 AWG	206 ft (63 m)
700W or 700W emergency	12 AWG	164 ft (50 m)
	14 AWG	103 ft (31 m)

Prepare for Installation



Note: *Mounting hardware and installation location must support at least 20 lb (9 kg), which includes the ArcLamp Driver, conduit hardware, and all cable required for installation.*

Supplies

The following supplies are required, but not provided, for ArcLamp Driver installation.

- Conduit and conduit fittings
- Appropriate strain relief connectors for the installation type, as needed
- Phillips head screw driver
- Four each mounting bolts or screws and wall anchors, as needed

Electrical and Wiring Specification

Install the ArcLamp Driver on a power distribution system with reliably identified earthed neutral and install a maximum 15A circuit breaker on the line conductor.



WARNING: A system without an accessible power disconnect device cannot be serviced or operated safely. Follow all local codes and restrictions.

The ArcLamp Driver accepts 100-240 VAC, 50/60Hz (for emergency models only: requires normal sense and maintained (emergency) input power).

ETC recommends installing all wiring in grounded metal conduit.

Wire and Terminal Specifications

Terminal / Connector	Wire Range / Specification	Strip Length	Torque Rating
Power Input - line/neutral/ground	12-14 AWG (solid or stranded)	1/4 in 7 mm	4 in lb 0.5 Nm
Output - line/neutral/ground	14 AWG (150W driver models) (2 mm ² solid or 1.5 mm ² stranded)	1/4 in 7 mm	4 in lb 0.5 Nm
	12-14 AWG (350W and 700W driver models) (3.3-2 mm ² solid or 2.5-1.5 mm ² stranded)		
DMX In/Thru 8-pin connector (350W and 700W standard and emergency models only)	Belden 9729 (or equivalent)	A 120Ω resistor (not provided) is required to terminate the last DMX device in a control run. See DMX (Belden 9729) Cable Preparation on page 19 .	
DMX In/Thru RJ45 Connectors	Cat5e (or better) minimum 24 AWG conductors terminated to T568B standard	N/A	N/A

Refer to [Channel Electrical Specifications](#) on [page 7](#) for the limits on current, power, and number of 4.4W ArcLamps per output channel and driver.



Note: All output channels have onboard electronic overload protection. See [System Power Up](#) on [page 21](#).

Mount the Driver

- 1: Using a Phillips head screw driver, remove the two screws securing the cover to the ArcLamp Driver enclosure. Set screws aside for later re-installation. The cover is grounded by a tether to the enclosure.
- 2: Align the ArcLamp Driver in its desired installation location and mark, then pre-drill the four mounting holes.



Note: Vents on back of driver must **not** make contact with the wall for proper airflow.

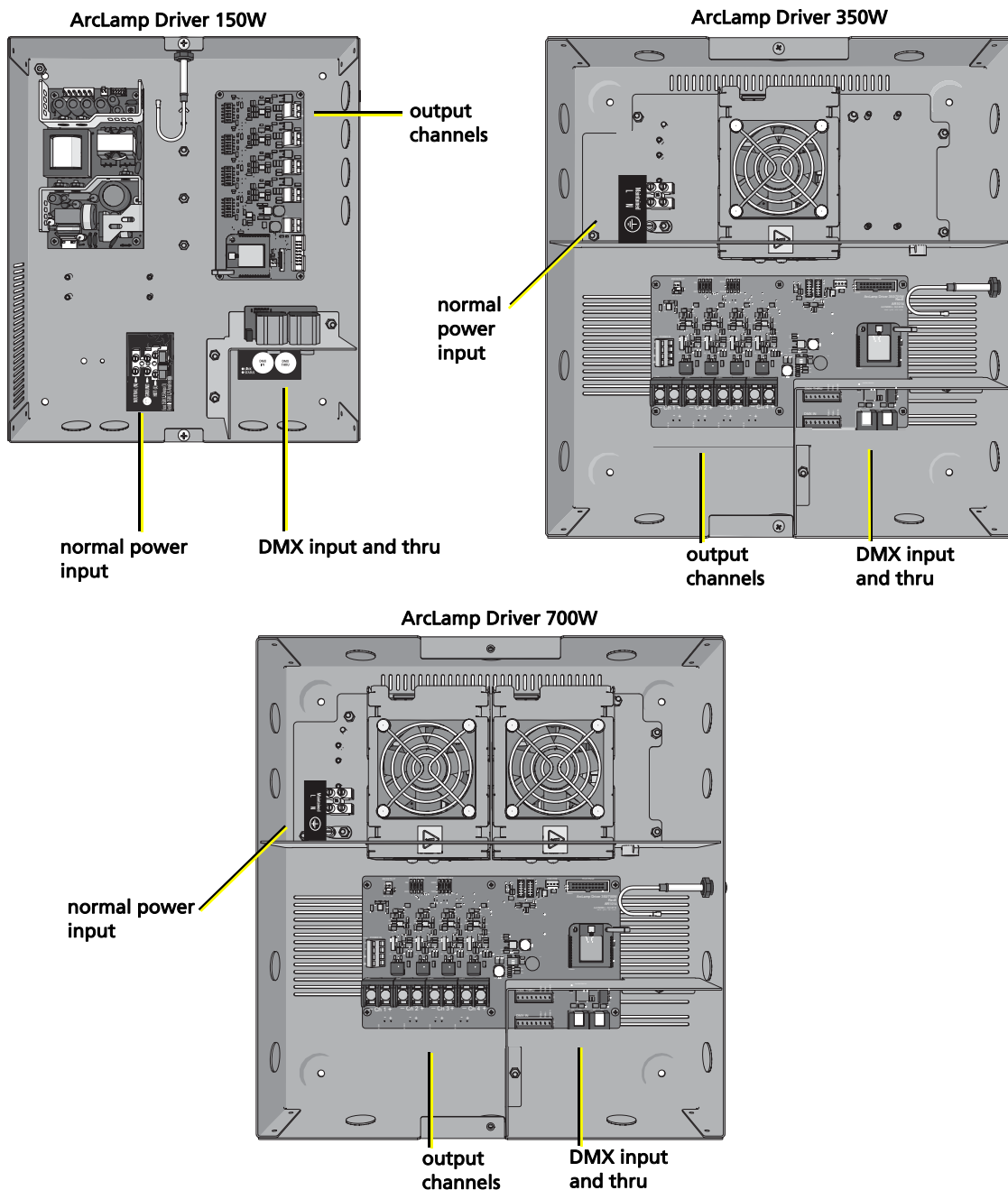
- 3: Install wall anchors as needed.
- 4: Align the driver to the mounting location and install the mounting hardware. Secure the hardware.
- 5: Each non-vented edge of the enclosure offers conduit knockouts. Remove the knockouts required based on your installation wire plan and install conduit hardware accordingly.

Terminate Wiring



WARNING: RISK OF DEATH BY ELECTRIC SHOCK! Before you begin pulling and terminating wire to the ArcLamp Driver enclosure, make sure the main circuit breaker cabinet or other readily accessible input power disconnect device for the normal power input (and emergency power input when used) is locked out and tagged out. Enclosures installed without an accessible input power disconnect device cannot be serviced or operated safely. Follow all local codes and restrictions. When the disconnect device is not located near the installed enclosure, the disconnect must allow for proper lockout / tagout.

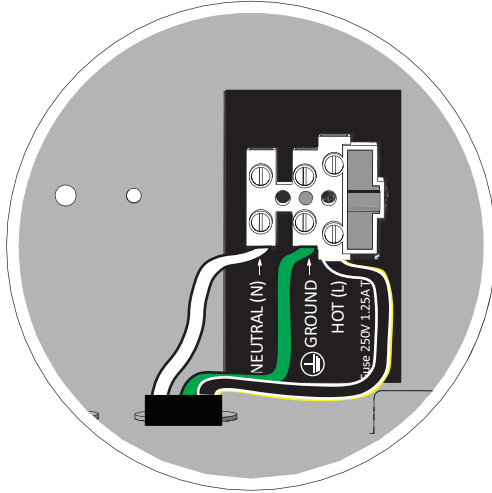
Diagrams and instructions for emergency/UL924 models are located in [ArcLamp Emergency Driver Power Input Wiring](#) on [page 32](#).



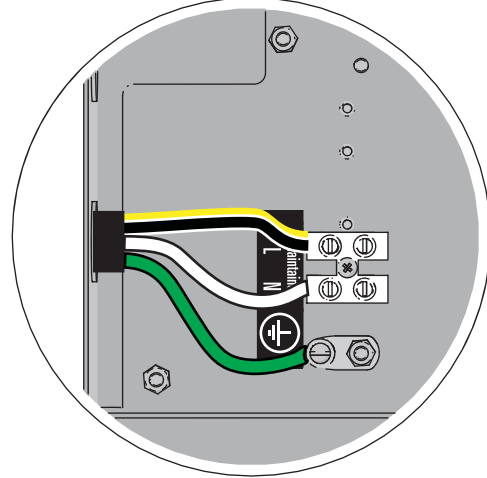
Power Input Wiring

This section provides power input wiring termination for standard model ArcLamp Drivers. Reference [ArcLamp Emergency Driver Power Input Wiring](#) on [page 32](#) for instructions to terminate normal sense and emergency power input wiring.



ArcLamp Driver 150W input wiring detail



ArcLamp Driver 350W/700W input wiring detail

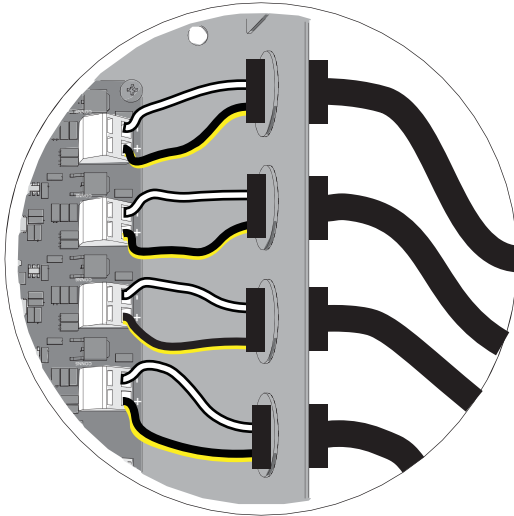


Note: *Power wiring should only be installed and terminated by a qualified electrician and should follow standard wiring installation practices.*

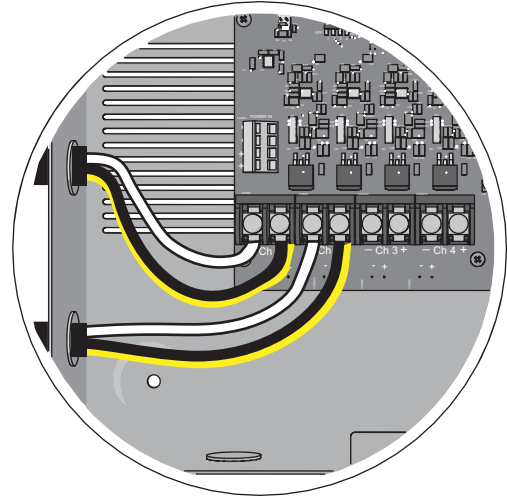
- 1: Make sure power is off at the main circuit breaker.
- 2: See [Wire and Terminal Specifications](#) on [page 13](#) for specification of wire, strip length, and terminal torque ratings. Prepare the wires accordingly.
- 3: Loosen the three screw terminals for NEUTRAL (N), GROUND , and LINE (L) connections.
- 4: Insert the ground wire (typically green) into the GROUND  terminal and tighten the screw.
- 5: Insert the neutral wire (typically white) into the NEUTRAL (N) terminal and tighten the screw.
- 6: Connect the hot wire (typically black) into the HOT (L) terminal and tighten the screw.
- 7: Tug gently on the wires to ensure they are secure.

Output Wiring to Fixture

ArcLamp Driver 150W and ArcLamp Emergency Driver 150W output channel wiring detail. All four output channels are shown wired.



ArcLamp Driver 350W/700W and ArcLamp Emergency Driver 350W/700W output channel wiring detail. Output channels 1 and 2 are shown wired and 3 and 4 are shown disconnected.



Power wires (line wire (hot) and neutral wire) from the installed fixture are terminated to output terminals on the ArcLamp Driver. Termination is available for up to four uniquely addressable outputs (channels).



Note: *Power wiring should only be installed and terminated by a qualified electrician and should follow standard wiring installation practices.*

- 1: Make sure power is off at the main circuit breaker.
- 2: See [Wire and Terminal Specifications](#) on [page 13](#) for specification of wire, strip length, and terminal torque ratings. Prepare the wires accordingly.
- 3: Terminate neutral and line (hot) wires to an output.
 - a: Run a neutral wire (typically white) and a line wire (typically black) through conduit from the fixture to the ArcLamp Driver output terminals. Output channels are labeled LED OUT 1, LED OUT 2, LED OUT 3, and LED OUT 4 on 150W and 150W UL924 models. All other models are labeled CH1, CH2, CH3, CH4.
 - b: Terminate the neutral wire to the output channel “-” terminal, securing the terminal screw onto the wire.
 - c: Terminate the line (hot) wire to the output channel “+” terminal, securing each terminal screw onto the wire.
 - d: Tug gently on the wires to ensure they are secure.

Bridging Output Channels

It is acceptable to bridge multiple output channels together, ganging the maximum output allowed into a single combined output channel. See [Bridging Output Channels](#) on [page 28](#) for examples of the configurations made possible by bridging output channels.



Note: *This installation technique reduces the number of available output channels.*

For example, bridging two output channels on an ArcLamp Driver 700W provides a single 320W output channel that can power up to 60 4.4W ArcLamps.



Note: *A maximum of two output channels can be bridged together on an ArcLamp Driver 700W or ArcLamp Emergency Driver 700W.*

For more information, see [Bridging Output Channels](#) on [page 28](#).

DMX In and DMX Thru

DMX In and DMX Thru cables terminate to RJ45 connectors (all models) or to 8 pin connectors (350W and 700W standard and emergency models). DMX is installed in a daisy chain topology and includes one pair of wires (data +, data -) plus an ISO ground (common).

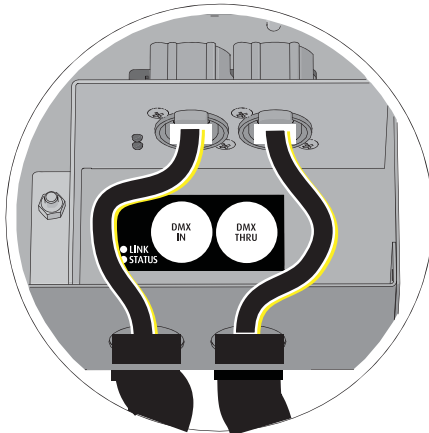
Terminate DMX In and Thru (RJ45 connectors, all models)

ETC recommends Cat5e (or better) minimum 24 AWG conductors terminated to T568B standard. The DMX In and Thru RJ45 connectors on the 350W and 700W standard and emergency models are not labeled and are interchangeable. Their locations are shown below.

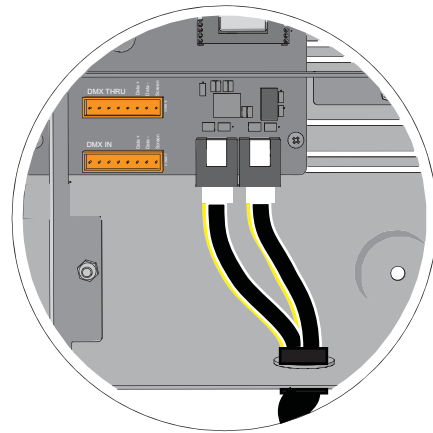
RJ45 pinout

Pin	Description
1	data +
2	data -
7 & 8	ground

detail of DMX in and thru plugged into RJ45 connectors



ArcLamp Driver 150W (ArcLamp Emergency Driver 150W is similar)



ArcLamp Driver 350W (ArcLamp Emergency Driver 350W/700W and ArcLamp Driver 700W are similar)



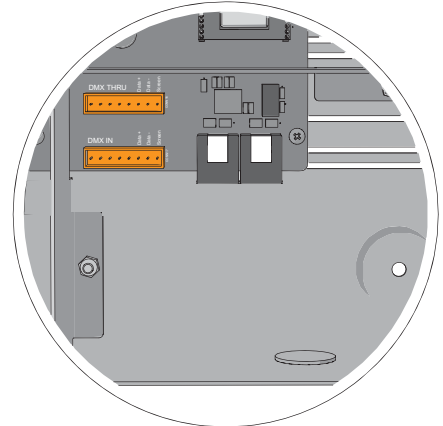
Note: *ArcLamp System drivers are not self-terminating. You must terminate the last driver in line with a dummy plug in the RJ45 Thru receptacle. To purchase an RJ45 terminator, please contact your ETC customer service representative and request part number N4086.*

Terminate DMX In and Thru (8 pin connector, 350W and 700W standard and emergency models)

8 pin connector pinout

Pin	Description
1	ground ("Screen")
2	data -
3	data +

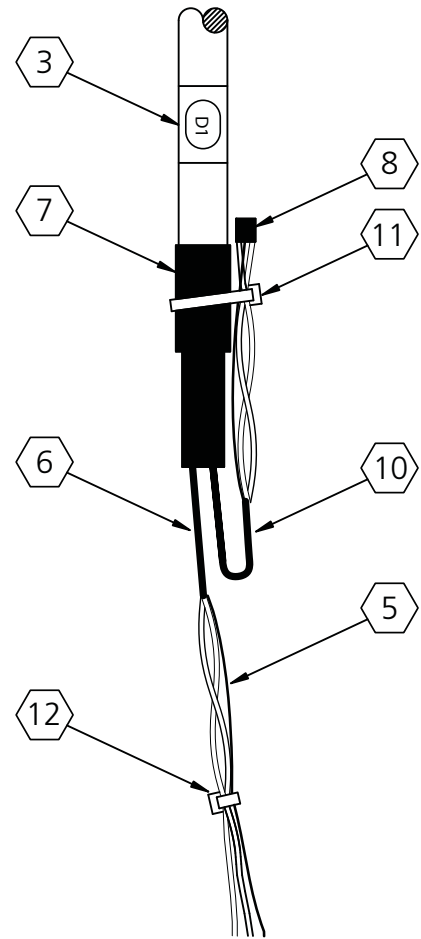
detail of DMX in and thru 8 pin connectors



ArcLamp Driver 350W
(ArcLamp Emergency Driver 350W/700W
and ArcLamp Driver 700W are similar)

DMX (Belden 9729) Cable Preparation

- 1: Cut cable (if necessary), leaving an 8 in. (20 cm) tail extending from the edge of the box.
- 2: Strip 7 in. (18 cm) of the outer jacket off.
- 3: Label the cable with the data type and run designation. (DMX1, DMX2, etc.)
- 4: Strip the foil shielding from each wire set back to within 1/4 in. (6 mm) of the outer jacket.
- 5: Untwist the shield wire from each pair and apply a piece of 1/16 in. (2 mm) clear heat shrink to each shield wire.
- 6: Twist each shield wire back onto its data pair, then apply a 1.5 in. (38 mm) piece of 3/16 in. (5 mm) heat shrink all the way down each 3-wire set. Make sure to capture the foil shielding at the base.
- 7: Apply the 2 in. (50 mm) of the 3/8 in. (10 mm) heat shrink centered on the end of the cable jacket and the bases of all the wires in the cable.
- 8: Cap the ends of the unused pair of wires with a 1 in. (25 mm) of 3/16 in. (5 mm) heat shrink centered over the end of the wires.
- 9: Strip 3/16 in. (5 mm) of insulation off all of the wires to be used.

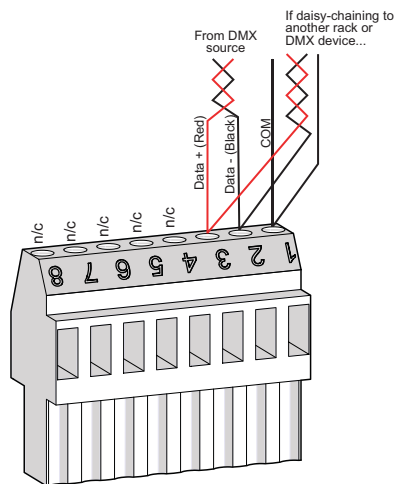


Note: *In the case of two wires landing at the same terminal, strip both wires to 3/4 in. (19 mm), twist them together tightly and then trim them to 3/16 in. (5 mm).*

- 10: Bend back the unused set of wires.
- 11: Secure the unused wires to the cable with a wire tie.
- 12: Secure the terminated wire set(s) together with a wire tie 2 in. (50 mm) from the termination point.
- 13: Insert the shield wire into the DMX IN common/ground (GND) terminal and tighten the screw firmly onto the wire.
- 14: Insert the Data - wire into the DMX IN Data - terminal and tighten the screw firmly onto the wire.
- 15: Insert the Data + wire into the DMX IN Data + terminal and tighten the screw firmly onto the wire.



Note: Specific wire colors will vary based on the DMX cable used.



The graphic on the left illustrates DMX In and Thru termination using screw terminal connectors intended for use with Belden 9729 cable (or equivalent).

Screw terminal connectors are supplied in the DMX Preparation Kit w/Screw Connector (part number 4100A1012) and shipped with your ArcLamp System product.

Cable other than Belden 9729 may have a different color code for its wire pairs.



Note: *ArcLamp System drivers are not self-terminating. You must terminate the last driver in line with a 120 ohm resistor (not provided) installed between terminals/pins 2 & 3 of the Thru output.*



Note: *Total length of Belden 9729 should not exceed 1600 feet (487m) between the control source and the ArcLamp Driver.*

ArcMesh

A wireless installation using ArcMesh control is an ideal solution for retrofit situations, where installing additional cable is not practical.

Using ArcMesh requires a minimum of one TX1 Transmitter. The TX1 converts wired DMX data into the wireless ArcMesh protocol. For more information on ArcMesh, consult the GDS ArcSystem Wireless Design Guide available for download from etconnect.com/ArcSystem.

Chapter 3

System Power Up



Note: *Read this section completely before powering up the system.*



WARNING: A system without an accessible power disconnect device cannot be serviced or operated safely. Follow all local codes and restrictions.



WARNING: RISK OF DEATH BY ELECTRIC SHOCK! Before you begin pulling and terminating wire to the ArcLamp Driver enclosure, make sure the main circuit breaker cabinet or other readily accessible input power disconnect device for the normal power input (and emergency power input when used) is locked out and tagged out. Enclosures installed without an accessible input power disconnect device cannot be serviced or operated safely. Follow all local codes and restrictions. When the disconnect device is not located near the installed enclosure, the disconnect must allow for proper lockout / tagout.

Power Up Procedure

- 1: Verify that all fixtures to be powered by the ArcLamp Driver have ArcLamps installed and the provided caution label has been installed on the fixture for future lamp replacement reference.
 - 2: Check the DMX control source to ensure proper installation and termination per the manufacturer's instruction.
 - 3: Check that all wires are terminated properly and secure in the ArcLamp Driver terminals.
 - 4: Replace the front cover of the ArcLamp Driver.
 - 5: Apply power at the main circuit breaker providing power to the ArcLamp Driver.
 - 6: 350W and 700W standard and emergency drivers only: verify LED status on the front of the ArcLamp Driver. See [LED Indicators \(350W and 700W standard and emergency models only\)](#) on [page 22](#).
 - 7: ArcLamps will light.
-



Note: *All ArcLamp Drivers are factory set to provide 100% output level to all circuits. This allows an electrical contractor to check that all products are properly installed and wired. During system commissioning, the certified ETC technician will remove this setting and configure DMX addresses for normal use. During normal use after commissioning is complete, ArcLamps will light if the DMX Control level is greater than 0.*

Troubleshooting

LED Indicators (350W and 700W standard and emergency models only)

On 350W and 700W standard and emergency models, the Status LED will blink or stay solid for short periods during normal operation. See the table below for LED behavior.

Power LED	On: power is present Off: power is not present
EM Active (emergency models only)	On: ArcLamp Driver has lost its normal sense input and is currently in emergency override state - all output channels are on at 100%.
PSU 1 Fault (700W and 700W emergency models only)	On: power supply 1 has a fault. Contact ETC technical services for assistance.
PSU 2 Fault (700W and 700W emergency models only)	On: power supply 2 has a fault. Contact ETC technical services for assistance.
DMX In	Slow Flash (wireless operation): normal operation. DMX broadcast is being received and DMX data is not changing. Solid On (wireless operation): active DMX signal is being received Solid On (wired DMX): DMX is present
Status	Steady blinking: processor is operating normally Solid On: system is responding to DMX instruction Solid On when no DMX command is being sent: there is a processor fault. Contact ETC technical services for assistance.
Channel OK LEDs	Solid On with no Channel Limit LEDs lit: channel is outputting normally Off: main power to ArcLamp Driver is off. Steady blinking, alternating with Channel Limit LED: channel output exceeded the trip limit. Lamps will flash. See Overload Protection on page 23 . Contact ETC technical services for assistance.
Channel Limit LEDs	Solid on: channel output exceeded the warning limit. See Overload Protection on page 23 . Contact ETC technical services for assistance. Steady blinking, alternating with Channel OK LED: channel output exceeded the trip limit. Lamps will flash. See Overload Protection below. Contact ETC technical services for assistance.



Note: For more information about warning and trip behavior, see [Overload Protection](#) on [page 23](#).

Overload Protection

There are two types of maximum output limit: warning and trip. Contact ETC technical services for assistance with warning and fault conditions.

Warning

On 350W and 700W standard and emergency models only, the Channel OK LED will remain solid on and the Channel Limit LED will light if the current drawn on any channel exceeds the warning limits.

Trip

On all models, lamps will flash if the current drawn on any output channel exceeds the trip limits. The protection circuit retries the connection every 1 second until the trip condition is resolved or the main circuit breaker supplying power to the ArcLamp Driver is shut off. If all channels draw current below the trip limits, the circuit will reconnect and lamps will stop flashing.

Trip LED behavior

On 350W and 700W standard and emergency models only, the Channel OK LED and Channel Limit LED will alternate flashing if the current drawn on any output channel exceeds the trip limits. Channel Limit LEDs will turn off and Channel OK LEDs will turn solid on when the circuit reconnects.

Warning Limits and Trip Limits

ArcLamp Driver Description	Warning Limits				Trip Limits			
	Single Channel	Number of Channels Per Bridge			Single Channel	Number of Channels Per Bridge		
		2	3	4		2	3	4
150W					1.6A	3.2A	4.8A	6.4A
350W	3.5A	7A	10.5A	14A	3.65A	7.3A	10.95A	14.6A
700W	7A	14A	NOT POSSIBLE		7.3A	14.6A	NOT POSSIBLE	
150W emergency					1.6A	3.2A	4.8A	6.4A
350W emergency	3.5A	7A	10.5A	14A	3.65A	7.3A	10.95A	14.6A
700W emergency	7A	14A	NOT POSSIBLE		7.3A	14.6A	NOT POSSIBLE	

See [Bridging Output Channels](#) on [page 28](#) for more information about bridging channels.

Fade to Warm Behavior

In order to enable fade to warm behavior, Fade to Warm Inhibit must be unchecked in ArcSystem commissioning software at the time of initial system setup.

Configuration and Commissioning

Initial system configuration, commissioning, and end-user training of an ArcLamp system will be accomplished by an ETC certified technician.

For commissioning of hard wired DMX systems, a TX1 transmitter is required in addition to the USB commissioning tool and ArcSystem commissioning software for Windows PCs. If your hard wired DMX system does not have a TX1, an ETC certified technician will provide one for system commissioning.



Note: *If subsequent programming is requested, customer training on the programming software can be purchased.*

The following check list will be included during the configuration process:

- Patching groups of fixtures to specific DMX channels
- Assigning minimum and maximum dimming levels per group
- Assigning power fail/recovery options per group
- Setting up preset recall if using the 8 Button Station or external triggers

Maintenance



WARNING: A system without an accessible power disconnect device cannot be serviced or operated safely. Follow all local codes and restrictions.

ArcLamps



WARNING: Disconnect power to the fixture before performing any cleaning and maintenance.

Inspect the ArcLamps for dust. As needed, use a lint-free cloth to wipe the lamps.

ArcLamp Driver



WARNING: RISK OF DEATH BY ELECTRIC SHOCK! Failure to disconnect all power to the system before maintenance, cleaning or other system modification, could result in serious injury or death.

De-energize the main feed to the ArcLamp Driver and follow appropriate Lockout/Tagout procedures as described in NFPA Standard 70E. It is important to note that electrical equipment such as the ArcLamp Driver can present an arc flash safety hazard if improperly serviced. This is due to available large short circuit currents on the feeders of the equipment. Any work on energized equipment must comply with OSHA Electrical Safe Working Practices.

- Inspect the all mounting hardware for secure installation. As needed, replace worn or damaged hardware.
 - Check for excessive dust or debris in the air flow vents around the ArcLamp Driver enclosure. Clean the vents using compressed air or a soft lint-free cloth. Keeping the components of the enclosure clean facilitates efficient cooling.
-



Note: A can of compressed air or oil-free air from an air compressor, set at a low setting, can be used to blow dust and debris from the vents on the ArcLamp Driver. Dust buildup can cause overheating and premature failure of the system.

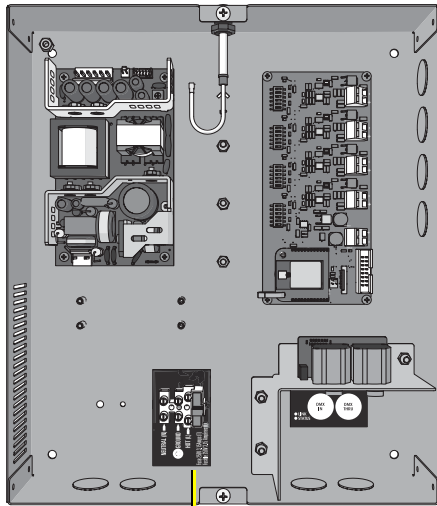


CAUTION: Never spray liquids into the ArcLamp Driver and never spray compressed air into an ArcLamp Driver that is powered up.

Fuses

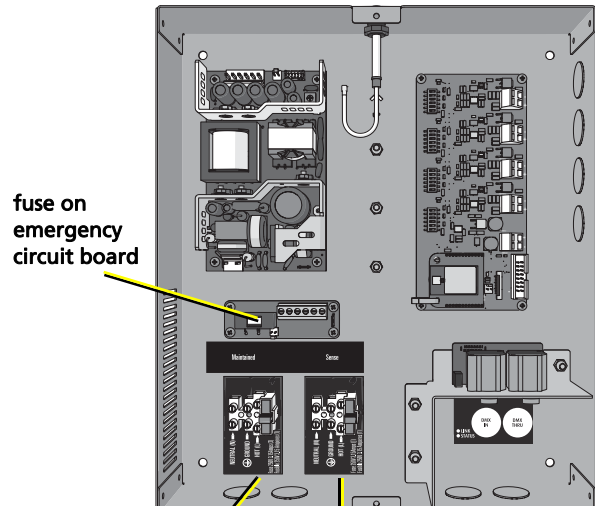
All models of ArcLamp System Driver have replaceable fuses except the 350W and 700W non-emergency models.

ArcLamp Driver 150W



fuse on normal power input

ArcLamp Emergency Driver 150W

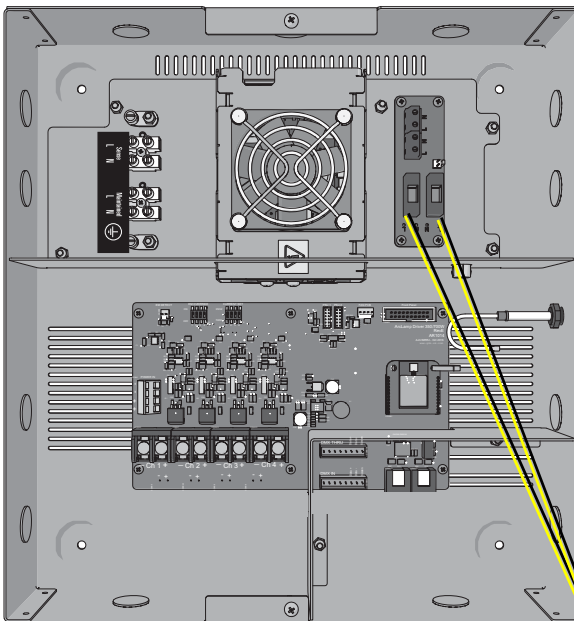


fuse on
emergency
circuit board

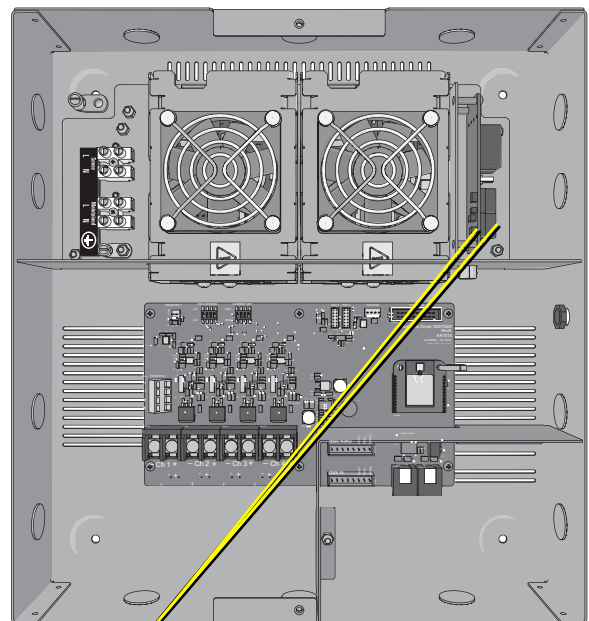
fuse on maintained
(emergency) power
input

fuse on normal sense
power input

ArcLamp Emergency Driver 350W



ArcLamp Emergency Driver 700W



fuses on emergency
circuit board

Driver Description	Quantity	Fuse	Location
150W	1	3.150A, 250V, 5x20 mm	normal power input terminal block
350W	0	N/A	
700W	0		
150W emergency	2	3.150A, 250V, 5x20 mm	normal sense and maintained (emergency) power input terminal blocks
	1	1.250A, 250V, 5x20 mm	emergency circuit board
350W emergency	2	3.150A, 250V, 5x20 mm	emergency circuit board
700W emergency	2	3.150A, 250V, 5x20 mm	emergency circuit board

Appendix A

Bridging Output Channels

It is acceptable to bridge multiple output channels together, ganging the maximum output allowed into a single combined output channel. See below for examples of the configurations made possible by bridging output channels.



Note: *This installation technique reduces the number of available output channels.*

For example, bridging two output channels on an ArcLamp Driver 700W provides a single 320W output channel that can power up to 60 4.4W ArcLamps. See the table below for bridge specifications.



Note: *A maximum of two output channels can be bridged together on an ArcLamp Driver 700W or ArcLamp Emergency Driver 700W.*

Bridge Specifications

ArcLamp Driver Model	Bridge Configuration	Max. 4.4W ArcLamps on new Channel	Max. Current on new Channel	Max. Power on new Channel
150W	2 bridged into 1	12	3A	72W
150W	3 bridged into 1	18	4.5A	108W
150W	4 bridged into 1	25	6A	144W
350W	2 bridged into 1	30	7A	160W
350W	3 bridged into 1	45	10.5A	240W
350W	4 bridged into 1	60	14A	320W
700W	2 bridged into 1	60	14A	320W
700W	3 bridged into 1	NOT POSSIBLE		
700W	4 bridged into 1			



Note: *All output channels have onboard overload protection. See [Overload Protection](#) on [page 23](#).*



Note: *The installation site must consider power requirements at the fixture and allow for voltage drop with distance. See [Voltage Drop](#) on [page 28](#).*

Voltage Drop

Correct operation of an ArcLamp requires a minimum of 21 VDC provided by the ArcLamp Driver at the ArcLamp. Voltage drop calculations vary by project and are based on the type, length, and gauge of wire used between the ArcLamp Driver and ArcLamp. Contact a qualified electrician or ETC technical services for further information.

The ArcLamp Driver must be installed within a maximum distance of the fixture with ArcLamps installed. Maximum distances will be reduced when bridging driver output channels together and are dependent on wire gauge. See [Wire and Terminal Specifications](#) on [page 13](#) for recommended wire gauges. For your convenience, an interactive voltage drop calculator is available at etcconnect.com/ArcLamp.

Bridging Kits

Three types of bridging kits are provided with ArcLamp Drivers:

- 1: 7490K2002 bridging kit for ArcLamp Driver 150W and ArcLamp Emergency Driver 150W
 - for bridging combinations of 2, 3, or 4 channels
 - two 3-position Wago connectors, each with two attached black wires, pre-stripped
 - one 5-position Wago connector with four attached black wires, pre-stripped
- 2: 7490K2003 bridging kit for ArcLamp Driver 350W and ArcLamp Emergency Driver 350W
 - for bridging combinations of 2, 3, or 4 channels
 - two 3-position Wago connectors, each with two attached black wires terminated with forks
 - one 5-position Wago connector with four attached black wires terminated with forks
- 3: 7490K2004 bridging kit for ArcLamp Driver 700W and ArcLamp Emergency Driver 700W
 - for bridging combinations of 2 channels
 - two 3-position Wago connectors, each with two attached black wires terminated with forks

Bridging Procedure



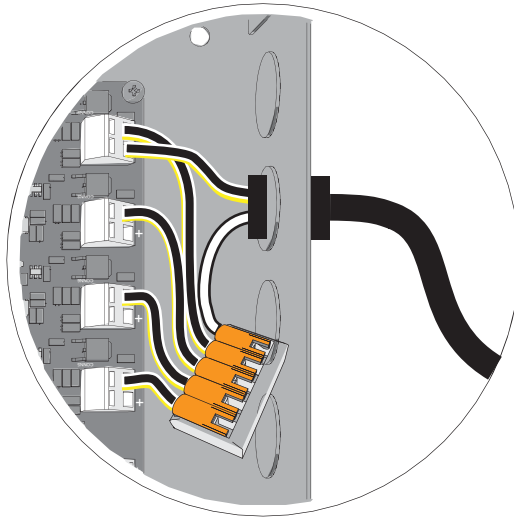
WARNING: RISK OF DEATH BY ELECTRIC SHOCK! Before you begin pulling and terminating wire to the ArcLamp Driver enclosure, make sure the main circuit breaker cabinet or other readily accessible input power disconnect device for the normal power input (and emergency power input when used) is locked out and tagged out. Enclosures installed without an accessible input power disconnect device cannot be serviced or operated safely. Follow all local codes and restrictions. When the disconnect device is not located near the installed enclosure, the disconnect must allow for proper lockout / tagout.



Note: *Power wiring should only be installed and terminated by a qualified electrician and should follow standard wiring installation practices.*

150W Drivers

ArcLamp Driver 150W

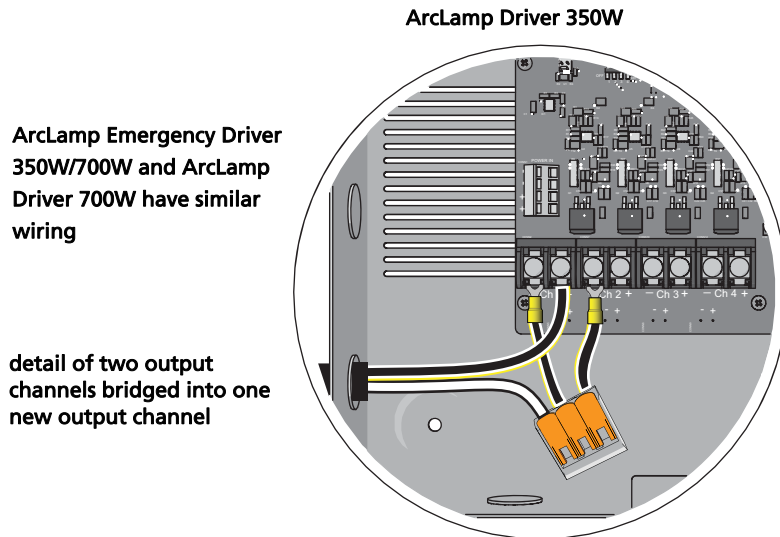


ArcLamp Emergency Driver 150W
has similar wiring

**detail of four output channels
bridged into one new output
channel**

- 1: Choose a Wago connector from the bridging kit with at least one more position than the number of channels to be bridged.
- 2: Bus the negative poles of the output channel connectors. Output channels are labeled LED OUT 1, LED OUT 2, LED OUT 3, and LED OUT 4.
 - Terminate one wire from the Wago to each negative terminal ("-") of the output channels to be bridged, securing the channel output connector terminal screw onto the wire. Tug gently to make sure the wires are secure.
- 3: Use a free position on the Wago connector as the negative terminal of the new output channel. Terminate the neutral wire (typically white) from the installed fixture to the negative terminal.
 - Run a neutral wire through conduit from the fixture to a free position on the Wago connector. Lift up the orange clip, insert the neutral wire, and press the clip down onto the wire. Tug gently to make sure the wire is secure.
- 4: Remove any unused wires from the Wago connector.
- 5: Use any positive terminal ("+") from a bridged channel as the positive terminal for the new output channel. Terminate the line (hot) wire (typically black) from the installed fixture to the "+" terminal of any bridged channel. See [Power Input Wiring](#) on [page 15](#) for further instructions on wiring an installed fixture to the output channel "+" terminal.

350W and 700W Drivers



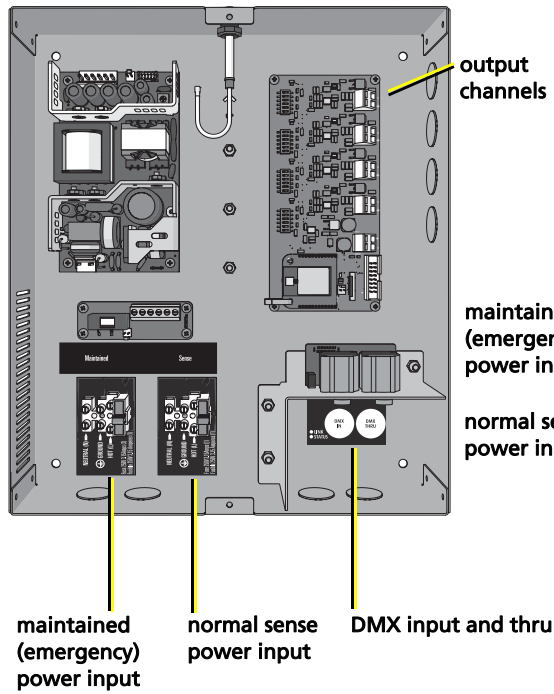
- 1: Choose a Wago connector from the bridging kit with at least one more position than the number of channels to be bridged.
- 2: Bus the negative poles of the output channel connectors. Output channels are labeled CH1, CH2, CH3, and CH4.
 - Terminate one jumper wire to each negative terminal ("-") of the output channels to be bridged, securing each terminal screw onto the fork. Tug gently to make sure the forks are secure.



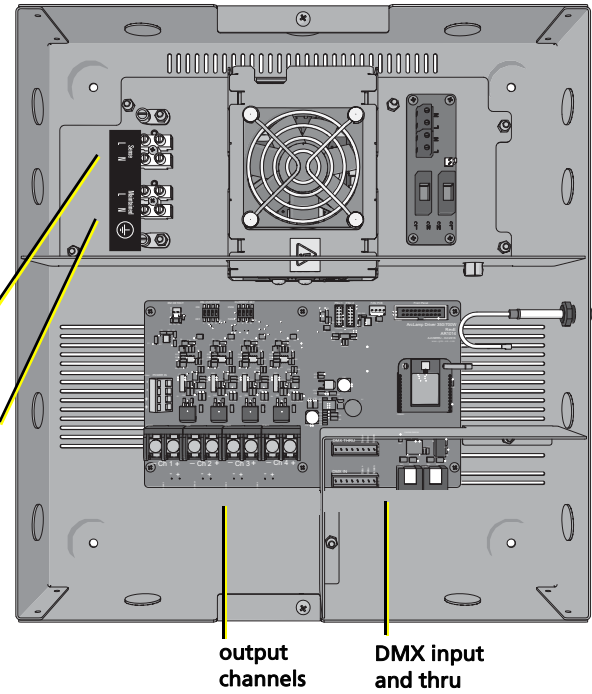
Note: *A maximum of two channels can be bridged together on an ArcLamp Driver 700W or ArcLamp Emergency Driver 700W.*

- 3: Use a free position on the Wago connector as the negative terminal of the new output channel. Terminate the neutral wire (typically white) from the installed fixture to the negative terminal.
 - Run a neutral wire through conduit from the fixture to a free position on the Wago connector. Lift up the orange clip, insert the wire, and press the clip down onto the wire. Tug gently to make sure the wire is secure.
- 4: Remove any unused wires from the Wago connector.
- 5: Use any positive terminal ("+") from a bridged channel as the positive terminal for the new output channel. Terminate the line (hot) wire (typically black) from the installed fixture to the "+" terminal of any bridged channel. See [Power Input Wiring](#) on [page 15](#) for further instructions on wiring an installed fixture to the output channel "+" terminal.

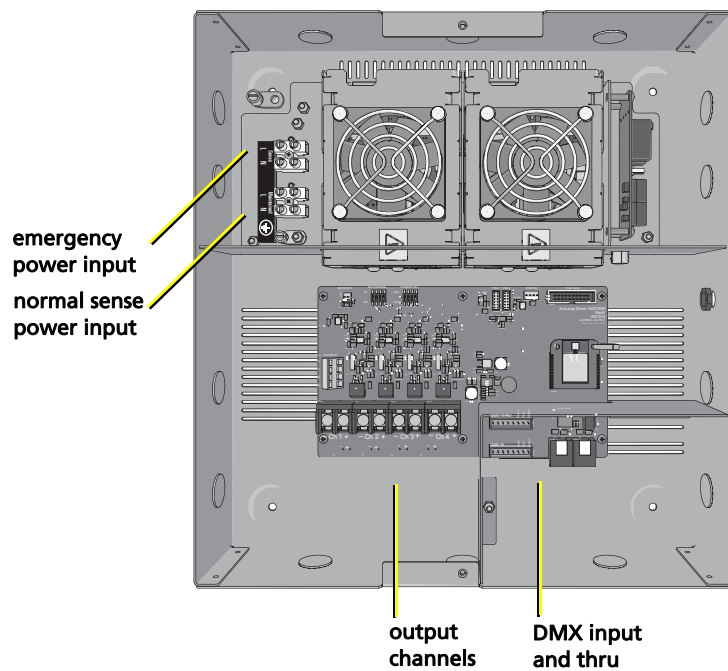
ArcLamp Emergency Driver 150W



ArcLamp Emergency Driver 350W



ArcLamp Emergency Driver 700W



ArcLamp Drivers are available in UL924 listed variants including:

- 150 watt (convection cooled) supplies power for up to 25 individual 4.4 watt ArcLamps
- 350 watt (single fan) supplies power for up to 60 individual 4.4 watt ArcLamps
- 700 watt (dual fans) supplies power for up to 120 individual 4.4 watt ArcLamps



Note: *Fixtures with ArcLamps installed must be hard wired to an ArcLamp Emergency Driver to be considered for UL924 certification.*

The installation must conform to local and national codes.

ArcLamp Emergency Drivers require two branch circuit power input connections, normal sense and maintained (emergency).

- Maintained (emergency) provides constant power to the ArcLamp Emergency Driver regardless of the state, enforcing the ability to maintain a lights on condition when needed. The power source must be connected to an emergency branch circuit with an upstream UL1008 automatic transfer switch.
- Normal sense detects when normal power is present. In the event of a normal power failure, the ArcLamp Emergency Driver will force all output channels on the ArcLamp Emergency Driver to full (100%). Any control of the connected output channels will be unavailable until normal power has been restored.

The complete installation procedure

With the exception of power input terminations, ArcLamp Emergency Driver installation requirements are the same as those of the standard ArcLamp Driver. Complete the installation as follows, referencing these sections for installation details:

- [Prepare for Installation](#) on [page 12](#)
- [Electrical and Wiring Specification](#) on [page 12](#)
- [Mount the Driver](#) on [page 13](#)
- [Terminate Normal Sense Input](#) on [page 35](#)
- [Terminate Maintained \(Emergency\) Input](#) on [page 36](#)
- [Output Wiring to Fixture](#) on [page 16](#)
- [DMX In and DMX Thru](#) on [page 17](#) and [DMX \(Belden 9729\) Cable Preparation](#) on [page 19](#)
- [ArcMesh](#) on [page 20](#)

After completing ArcLamp Emergency Driver installation, reference [System Power Up](#) on [page 21](#).

Terminate Normal Sense Input

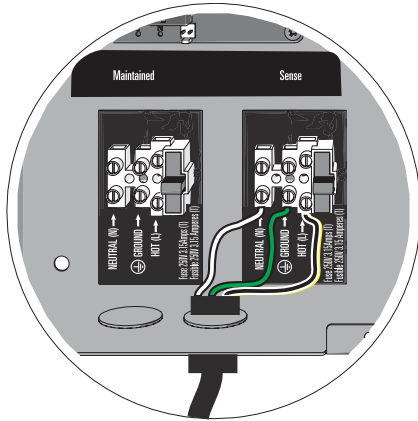


WARNING: A system without an accessible power disconnect device cannot be serviced or operated safely. Follow all local codes and restrictions.

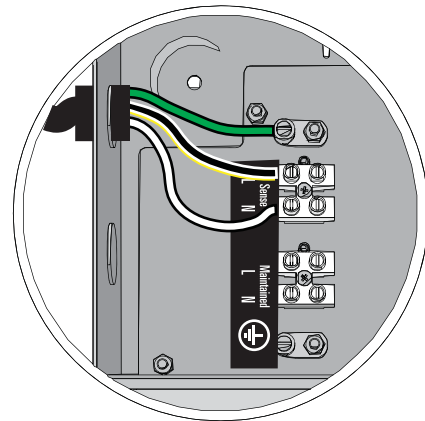


Note: Power wiring should only be installed and terminated by a qualified electrician and should follow standard wiring installation practices.

ArcLamp Emergency Driver 150W normal sense input wiring detail



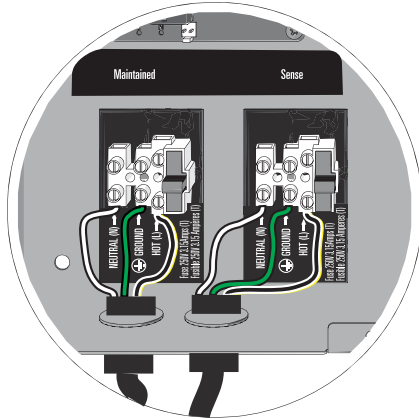
ArcLamp Emergency Driver 350W/700W normal sense input wiring detail



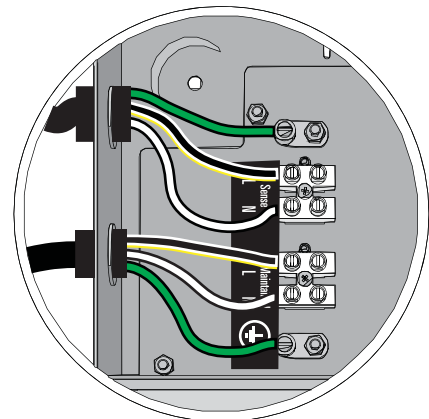
- 1: See [Wire and Terminal Specifications](#) on [page 13](#) for specification of wire, strip length, and terminal torque ratings. Prepare the wires accordingly.
- 2: Run ground, neutral and line (hot) wires between the ArcLamp Emergency Driver Sense input terminals and a normal power branch circuit.
 - a: Terminate the ground wire (typically green/yellow) to the ground screw provided. Insert the pre-stripped wire and tighten the screw to secure it in place.
 - b: Terminate normal neutral and normal line (hot) wires to the Sense input terminals.
 - Insert the neutral wire (typically white) into the Sense N terminal and tighten the screw firmly to secure it in place.
 - Insert the line (hot) wire into the Sense L terminal and tighten the screw firmly to secure it in place.

Terminate Maintained (Emergency) Input

ArcLamp Emergency Driver 150W normal sense and emergency input wiring detail



ArcLamp Emergency Driver 350W/700W normal sense input wiring detail

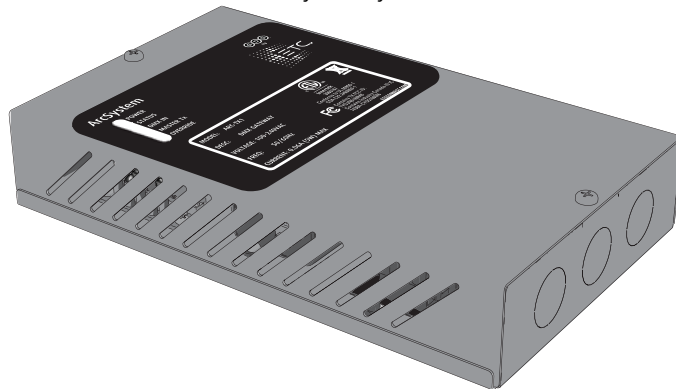


- 1: See [Wire and Terminal Specifications](#) on [page 13](#) for specification of wire, strip length, and terminal torque ratings. Prepare the wires accordingly.
- 2: Run ground, neutral, and line (hot) wires between the ArcLamp Emergency Driver Maintained input terminals and an emergency branch circuit with an upstream UL1008 automatic transfer switch.
 - a: Terminate the ground wire (typically green/yellow) to the ground screw provided.
 - Loosen the ground screw, insert the pre-stripped emergency ground wire, and tighten the screw firmly to secure both wires in place.
 - b: Terminate emergency neutral and line (hot) wires to the Maintained input terminals.
 - Insert the neutral wire (typically white) into the Maintained N terminal and tighten the screw firmly to secure it in place.
 - Insert the line (hot) wire into the Maintained L terminal and tighten the screw firmly to secure it in place.

Appendix C

TX1 Installation

ArcLamp systems can be controlled using the wireless ArcMesh protocol with TX1, hard wired for DMX control using a DMX control source, or a hybrid system of the two.



Note: *Read this section completely before beginning your system installation.*



WARNING: A system without an accessible power disconnect device cannot be serviced or operated safely. Follow all local codes and restrictions.



WARNING: RISK OF DEATH BY ELECTRIC SHOCK! Before you begin pulling and terminating wire to the ArcLamp Driver enclosure or TX1 Transmitter, make sure the main circuit breaker cabinet or other readily accessible input power disconnect device for the normal power input (and emergency power input when used) is locked out and tagged out.

Enclosures installed without an accessible input power disconnect device cannot be serviced or operated safely. Follow all local codes and restrictions. When the disconnect device is not located near the installed enclosure, the disconnect must allow for proper lockout / tagout.

Preparing for Installation



Note: *Mounting hardware and installation location must support the TX1 Transmitter, conduit hardware, and all cable required for installation.*

Supplies

The TX1 Transmitter includes four #10 mounting screws.

The following supplies are required, but not provided, for TX1 Transmitter installation.

- Conduit and conduit fittings
- Phillips head screw driver
- Four each wall anchors as needed

Electrical and Wiring Specification

The TX1 Transmitter accepts 100-240 VAC, 50/60Hz power input.

ETC recommends installing all wiring in grounded metal conduit.

Wire and Terminal Specifications

Terminal / Connector	Wire Range / Specification	Strip Length	Torque
power input - hot/neutral/ground	up to 10 AWG (solid or stranded) (up to 6 mm ²)	1/4 in 7 mm	4 in lb 0.5 Nm
AUX contact inputs - input 1 / input 2 / ground	22-14 AWG (solid or stranded) (0.6-1.6 mm ²)	3/16 in 5 mm	4 in lb 0.5 Nm
DMX in/out terminals	Belden 9729 (or equivalent)	See DMX (Belden 9729) Cable Preparation on page 19 .	

Surface Mounting

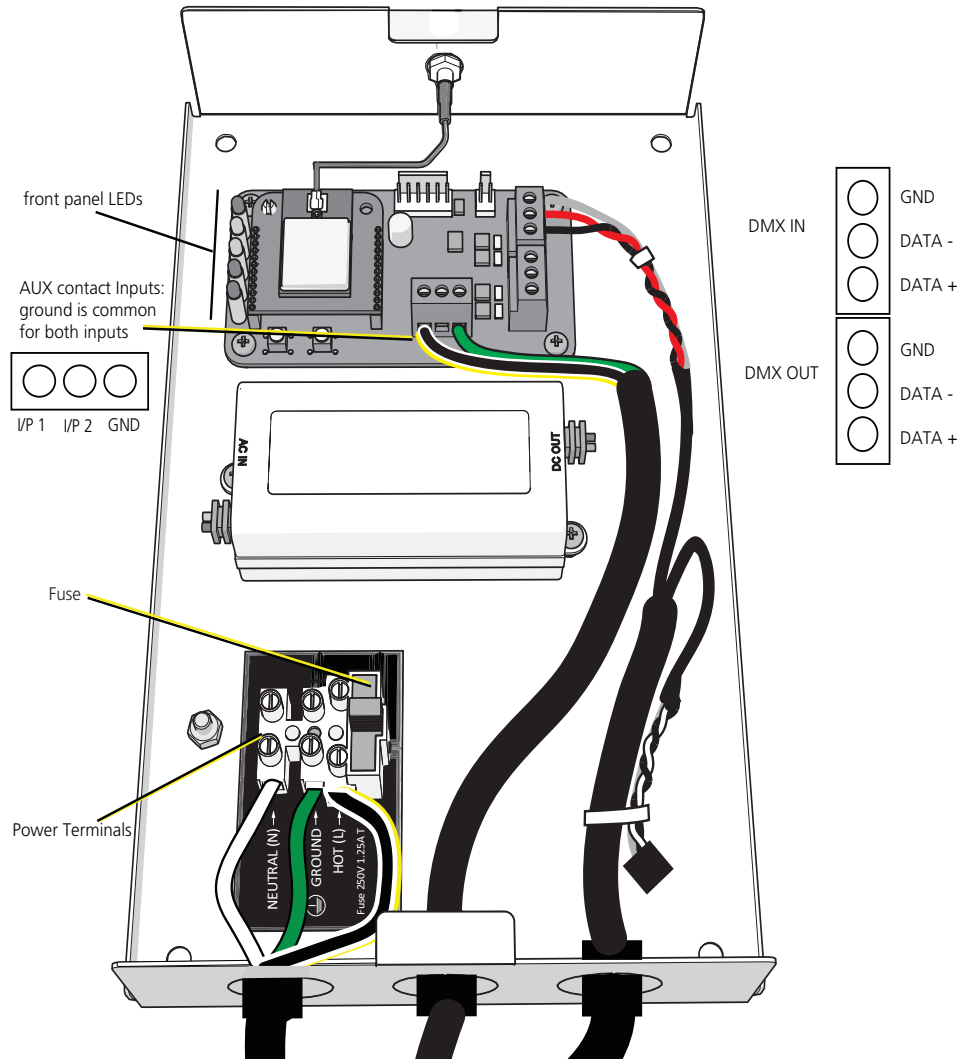
The TX1 Transmitter can simply be set on a flat horizontal surface, such as a table top, or surface mounted using the four holes located on the back side of the enclosure.

- 1: Remove the two screws securing the front of the TX1 to the enclosure. Save these screws for reinstallation later. The cover is tethered to the enclosure.
- 2: Align the TX1 to the installation location and secure it in place using the four #10 screws provided.
- 3: The TX1 enclosure is provided with three conduit knockouts. As required by local code, remove the knockouts and attach conduit.



Note: *Use suitable conduit where required by local or national code.*

Terminate Wiring





Power Input

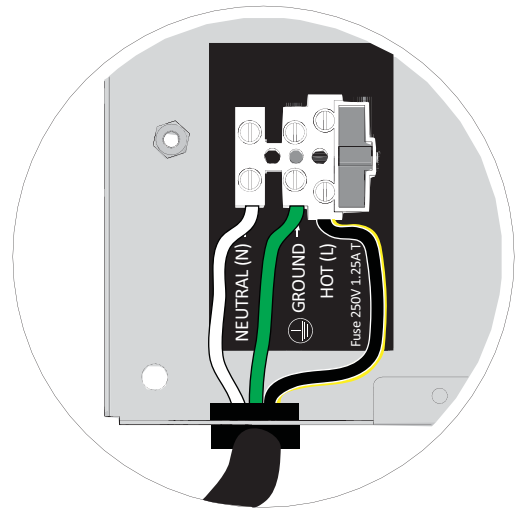


WARNING: A system without an accessible power disconnect device cannot be serviced or operated safely. Follow all local codes and restrictions.



Note: ETC recommends powering multiple TX1 transmitters from separate branch circuits.

- 1: Make sure all power is off at the main circuit breaker.
- 2: See [Wire and Terminal Specifications](#) on [page 38](#) for specification of wire, strip length, and terminal torque ratings. Prepare the wires accordingly.
- 3: Loosen the three screw terminals for NEUTRAL (N), GROUND , and LINE (L) connections.
- 4: Insert the ground wire (typically green) into the GROUND  terminal and tighten the screw.
- 5: Insert the neutral wire (typically white) into the NEUTRAL (N) terminal and tighten the screw, securing the wire in place.
- 6: Connect the hot wire (typically black) into the HOT (L) terminal and tighten the screw.
- 7: Tug gently on the wires to ensure they have been terminated completely.



detail of TX1 Transmitter power input

DMX In and DMX Out

DMX In and DMX Out cables terminate to terminal connections on the TX1 Transmitter board. Wire preparation and installation is the same for both In and Out.

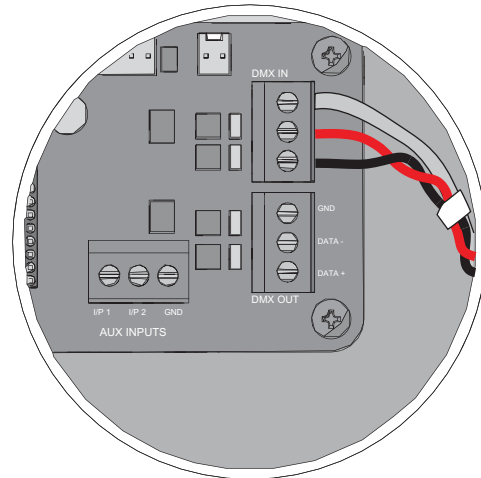
DMX is installed in a daisy chain topology and includes one pair of wires (data +, data -) plus an ISO ground (common). ETC recommends the use of Belden 9729 (or approved equal) wire. For best DMX performance, twist the wires together as close to the terminals as possible.



Note: *Total length of Belden 9729 should not exceed 1600 ft (487m) between the control source and the ArCLamp Driver.*

Onboard DMX In and Out terminal connections

Pin	Description
1	common/ ground (GND)
2	Data -
3	Data +



**detail of TX1 Transmitter with
DMX IN connected**

See [DMX \(Belden 9729\) Cable Preparation on page 19](#).

DMX Wire Termination

DMX In and DMX Out termination is the same.

- 1: Loosen all three screw terminals for GND, Data +, and Data - on the DMX header.
- 2: Insert the common wire into the GND terminal and tighten the screw, securing the wire in place.
- 3: Insert the Data + wire into the Data + terminal and tighten the screw.
- 4: Insert the Data - wire into the data - terminal and tighten the screw.
- 5: Tug gently on the wires to ensure they are secure.



Note: Specific wire colors will vary based on the DMX cable used.

Auxiliary Input

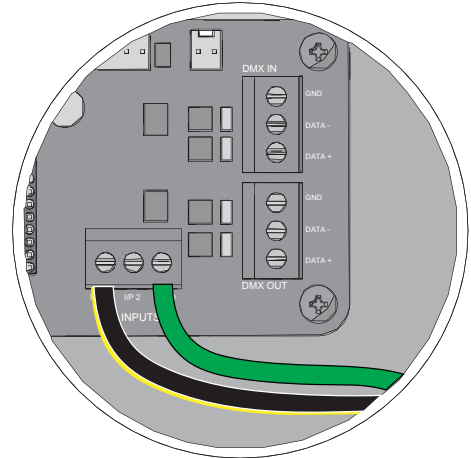
The AUX closed contact input allows the recall of two additional scenes within the TX1. An installation may utilize the two contact inputs to recall two additional scenes within the TX1 Transmitter when not connected to an external control system, such as a DMX control source. These can be used in conjunction with a fire alarm system or momentary remote push buttons.



WARNING: Do not connect line voltage to the Auxiliary Input terminals.

If applicable to your installation:

- 1: Make sure all power is off at the remote contact accessory.
- 2: See [Wire and Terminal Specifications](#) on [page 38](#) for specification of wire, strip length, and terminal torque ratings. Prepare the wires accordingly.
- 3: Terminate ground, and auxiliary contact wires to the auxiliary input terminals.
 - a: Install the ground (common) wire (typically green/yellow) to the GND terminal and secure the screw onto the wire. If your system requires two auxiliary contact inputs, the ground terminal will accept both wires.
 - b: Install the auxiliary input wire to the I/P 1 terminal and secure the screw onto the wire.
 - c: As needed, for systems requiring an additional auxiliary contact input, install the auxiliary input wire to the I/P 2 terminal and secure the screw onto the wire.



detail of TX1 Transmitter AUX input with input 1 (I/P1) and ground (GND) connected

Final Installation and Power Up

- 1: Check that all wires are terminated properly and secure in their terminals.
- 2: Replace the cover using the two screws previously removed.
- 3: Check the front panel LED's for status indication.

Front Panel LEDs

LED Indicator	Description
Power	solid red indicates the unit is powered
Status	pulsing, normal operation
DMX In	solid, indicates valid DMX is present
Master TX	solid, TX1 is the master
Override	solid, auxiliary contact input is active

Attach Antenna

The TX1 is supplied with a 5dB antenna providing 90 degree omni-directional coverage. Install this antenna to the TX1 antenna receptacle.

ArcLamp Drivers or other ArcSystem fixtures outside this coverage will be unable to communicate effectively. Due to the nature of the ArcMesh protocol, networked ArcLamp Drivers and ArcSystem fixtures outside of the transmission range may be able to connect through another in-range ArcLamp Driver or ArcSystem fixture. However, keeping as many ArcLamp Drivers and ArcSystem fixtures as possible within range of the TX1 broadcast will strengthen system reliability. When possible, it is best to keep the transformer within the same plane as the ArcLamp Drivers and ArcSystem fixtures.

If this not possible, other antenna types can be used. 2dB antennas offer 360 degree coverage in all directions but do have a shorter range. High power and directional antennas are available for specialist applications. See [Help from ETC Technical Services](#) on [page 2](#).

Dual Redundancy Operation

TX1 transmitters can be set up with dual redundancy, allowing a backup transmitter to take control if the master transmitter fails.



Note: *Transmitter switch-over may take up to 1 minute to complete depending on the size of the network.*

Dual redundancy requires the use of two TX1 transmitters and two separate and dedicated DMX inputs split using a third-party splitter. It is not possible to daisy-chain DMX through the TX1 transmitters because they have active outputs.



Note: *DMX Out is a regenerated data output signal, and not a passive through. Only the DMX channels that are patched to the 64 ArcSystem channels are available on the DMX Out port.*

When two transmitters are used on the same wireless network ID/radio channel, the system will determine a master transmitter and a backup transmitter. The TX1 with the highest MAC address will become the master. All system preset and configuration data is stored on both transmitters. The master transmitter is indicated by the solid red light on the front panel Master Tx LED. See [Front Panel LEDs](#) on [page 42](#).

Setup of dual redundancy is done at the time of system commissioning by an ETC certified technician. For more information on this process, contact ETC Technical Services.

Maintenance



WARNING: **A system without an accessible power disconnect device cannot be serviced or operated safely. Follow all local codes and restrictions.**

Fuses

The TX1 Transmitter has one 3.150A, 250V, 5x20 mm fuse located on the power input terminal block.



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